

NASA TECH BRIEF



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

Water Velocity Meter

A water current meter with a 0 to 6 ft/sec range has been developed for steady-state flow measurements. Two mutually perpendicular components of the drag force exerted on a perforated sphere (see fig.) are measured via strain-gage techniques similar to those applied in wind tunnel instrumentation. This force is then related to the flow velocity about the sphere as follows:

$$F = \sqrt{F_x^2 + F_y^2} \quad \text{where } F = \text{drag force}$$

θ = flow direction

$$\theta = \tan^{-1} \frac{F_x}{F_y}$$

ρ = fluid density

$$V = \sqrt{\frac{2F}{\rho A C_D}}$$

A = frontal area of drag sphere

C_D = drag coefficient

The velocity range of from 0 to 6 ft/sec corresponds to a force range on the order of from 0 to 1.7 lb.

These drag sphere velocity meters are simple and relatively inexpensive; and, when combined with an appropriate data acquisition system, they are well suited to applications where a large number of simultaneous measurements are needed for current mapping or velocity profile determination.

Note:

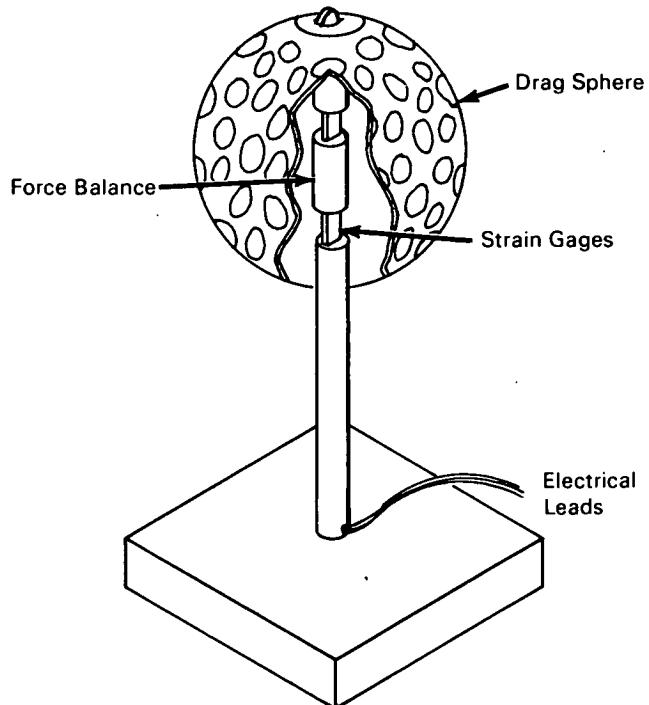
Additional documentation may be obtained from:

Technology Utilization Officer

Langley Research Center

Hampton, Virginia 23365

Reference: TSP70-10662



Patent status:

No patent action is contemplated by NASA.

Source: D. L. Smith and C. W. Roberts

Instrument Research Division

Langley Research Center

(LAR-10619)

Category 02